

Serial No. **10/609,400**

Docket No. **K-0533**

Amdt. dated April 11, 2007

Reply to Office Action of January 5, 2007

REMARKS/ARGUMENTS

Claims 1-6, 8, 10-15, 17 and 19-25 are pending in this application. By this Amendment, claims 1, 8, 10, 17 and 22 are amended, claims 23-25 are added, and claims 7, 9, 16 and 18 are canceled without prejudice or disclaimer. Support for the claims can be found throughout the specification, including the original claims and the drawings. Withdrawal of the rejections in view of the above amendments and the following remarks is respectfully requested.

I. Rejections Under 35 U.S.C. §102

A. Magdo

The Office Action rejects claims 1-3 and 5-9 under 35 U.S.C. §102(b) over U.S. Patent No. 4,256,532 to Magdo et al. (hereinafter “Magdo”). Claims 7 and 9 are cancelled. The rejection, in so far as it applies to the remaining claims, is respectfully traversed.

Independent claim 1 is directed to a mask for deposition of material on a flat display, comprising a first substrate having a plurality of first via holes formed therein, and a second substrate positioned on the first substrate, the second substrate having a plurality of second via holes formed therein. Independent claim 1 also recites a bridge positioned on a surface of the first substrate between adjacent first via holes, wherein the bridge extends between inner circumferential edges of a second via hole corresponding to the adjacent first via holes. Magdo neither discloses nor suggests at least such features, let alone the claimed combination of features.

Magdo discloses various embodiments of a separable silicon mask for use during an etching procedure in the fabrication of integrated circuits for a semiconductor device. For example, Madgo discloses in Figure 1 (referred to in the Office Action) a mask 10 including apertures 14 (compared in the Office Action to the recited first substrate and plurality of first via holes). The mask 10 is supported by a grid of support ribs 11 that define recesses 13 therebetween. Contrary to what is asserted in the Office Action, Applicant maintains the position that the support ribs 11 are not part of the mask 10, and, even if improperly considered a second substrate, the recesses 13 do not constitute holes formed in the structure of the support rib 11 itself. Thus, Applicant maintains the position that Magdo neither discloses nor suggests first and second substrates with first and second via holes respectively formed therein, as recited in independent claim 1.

However, even the mask 10, apertures 14, ribs 11 and recesses 13 disclosed by Magdo were improperly compared to the recited first and second substrates and first and second via holes, Magdo still neither discloses nor suggests a bridge as recited in independent claim 1. More specifically, Magdo neither discloses nor suggests any type of structure that is positioned on a portion of the mask 10 between adjacent apertures 14, and that extends from one rib 11 to another rib 11, as would the bridge recited in independent claim 1.

For at least these reasons, it is respectfully submitted that independent claim 1 is not anticipated by Magdo, and thus the rejection of independent claim 1 under 35 U.S.C. §102(b) over Magdo should be withdrawn. Dependent claims 2, 3, 5, 6 and 8 are allowable at least for

Amdt. dated April 11, 2007

Reply to Office Action of January 5, 2007

the reasons set forth above with respect to independent claim 1, from which they depend, as well as for their added features.

B. Bohlen

The Office Action rejects claims 1-3, 5, 6, 10-12, 14, 15 and 22 under 35 U.S.C. §102(b) over U.S. Patent No. 4,417,946 to Bohlen et al. (hereinafter "Bohlen"). The rejection is respectfully traversed.

The features of independent claim 1 are as set forth above. Independent claim 10 is directed to a mask for deposition of material on a flat display, comprising a first substrate having a plurality of first via holes formed therein, a second substrate positioned on the first substrate, the second substrate having a plurality of second via holes formed therein, and a third substrate positioned on the second substrate, the third substrate having a plurality of third via holes formed therein. Independent claim 10 also recites a bridge positioned on a surface of the first substrate between adjacent first via holes, wherein the bridge extends between inner circumferential edges of a second via hole corresponding to the adjacent first via holes. Bohlen neither discloses nor suggests the features of independent claims 1 and 10, or the respective claimed combinations of features.

Bohlen discloses a mask used in the fabrication of a semiconductor substrate. The mask includes three metal layers 5, 6 and 16 layered atop a P+ doped layer 3 of a silicon wafer. The metal layers 5, 6, 16 include apertures 11 of the same size formed by aligned vertical walls of the metal layers 5, 6, 16. The apertures 11 of the mask (metal layers 5, 6, 16) are aligned with

corresponding holes 14 formed in the doped layer 3. Applicant maintains the position that the comparison of the doped layer 3 to the recited second substrate is improper, because the mask is formed by the metal layers 5, 6, 16, and then placed onto the doped layer 3 of the wafer, so as to mask the wafer. Thus, Bohlen neither discloses nor suggests first and second via holes formed in first and second substrates, wherein each second via hole has a width greater than a width of a corresponding first via hole, as recited in independent claims 1 and 10, let alone that such holes define a deposition area on which source material is deposited, as recited in independent claims 1 and 10.

However, even if one or all of the first, second and third metal layers 5, 6, 16 which form the mask disclosed by Bohlen were improperly compared to the recited first substrate, and the doped layer 3 disclosed by Bohlen were improperly compared to the recited second substrate, as suggested in the Office Action, Bohlen still neither discloses nor suggests a bridge as recited in independent claims 1 and 10. More specifically, Bohlen neither discloses nor suggests any type of structure that is positioned on a portion of any one or all of the metal layers 5, 6, 16 between adjacent apertures 11, and that extends between opposite sides of a corresponding hole 14 formed in the doping layer 3, as would be bridge recited in independent claims 1 and 10.

Further, Bohlen discloses multiple metal layers 5, 6, 16 all with the same size aperture 11, and then a hole 14 formed in the doping layer 3 that appears to be larger than the aperture 11. However, Bohlen neither discloses nor suggests a third substrate having a plurality of third via

Amdt. dated April 11, 2007

Reply to Office Action of January 5, 2007

holes whose width is greater than that of a corresponding second via hole, as recited in independent claim 10.

Accordingly, it is respectfully submitted that independent claims 1 and 10 are not anticipated by Bohlen, and thus the rejection of independent claims 1 and 10 under 35 U.S.C. §102(b) over Bohlen should be withdrawn. Dependent claims 2, 3, 5, 6, 11, 12, 14, 15 and 22 are allowable at least for the reasons set forth above with respect to independent claims 1 and 10, from which they respectively depend, as well as for their added features.

C. Sakamoto

The Office Action rejects claims 1-3, 5, 6, 10, 14 and 15 under 35 U.S.C. §102(b) over U.S. Patent No. 5,234,781 to Sakamoto et al. (hereinafter "Sakamoto"). The rejection is respectfully traversed.

The features of independent claims 1 and 10 are as set forth above. Sakamoto neither discloses nor suggests the features of independent claims 1 and 10, or the respective claimed combinations of features.

Sakamoto discloses a mask used during lithographic patterning of a semiconductor device. The mask includes a base body 10 covered by a mask layer 11. The mask layer 11 has a number of patterning apertures 20-25 formed therein, and the base body 10 has a through hole 15 positioned beneath the apertures 20-25. Electron beams are then directed through the apertures 20-25 and hole 15 and onto a semiconductor surface, and material is removed from the semiconductor surface to form the desired pattern. Applicant maintains the position that the

apertures 25 and hole 15 facilitate the removal of material therethrough, and thus do not define a deposition area on which source material is deposited, as recited in independent claims 1 and 10.

However, even if the mask 11, apertures 20-25, base body 10 and the hole 15 were improperly compared to the recited first and second substrates and first and second via holes, Sakamoto still neither discloses nor suggests a bridge as recited in independent claims 1 and 10. More specifically, Sakamoto neither discloses nor suggests any type of structure that is positioned on a portion of the mask 11 that is between adjacent apertures 20-25, and that extends between opposite sides of the hole 15, as would the bridge recited in independent claims 1 and 10. Rather, such structure would likely block the transmission of electron beams through the patterning apertures 20-25, thus destroying the etching pattern to be formed on the surface of the semiconductor.

Further, Sakamoto discloses a single layer mask 11 positioned on a base body 10. Sakamoto neither discloses nor suggests a third substrate, let alone a third substrate including a plurality of third via holes, nor third via holes whose width is greater than the hole 15 in the base body 10 and/or the apertures in the mask 11, as the third via holes recited in independent claim 10.

Accordingly, it is respectfully submitted that independent claims 1 and 10 are not anticipated by Sakamoto, and thus the rejection of independent claims 1 and 10 under 35 U.S.C. §102(b) over Sakamoto should be withdrawn. Dependent claims 2, 3, 5, 6, 14 and 15 are

allowable at least for the reasons set forth above with respect to independent claims 1 and 10, from which they respectively depend, as well as for their added features.

D. Yoshizawa

The Office Action rejects claims 1-6, 10-15 and 22 under 35 U.S.C. §102(e) over U.S. Patent No. 6,916,582 to Yoshizawa et al. (hereinafter “Yoshizawa”). The rejection is respectfully traversed.

The features of independent claims 1 and 10 are as set forth above. Yoshizawa neither discloses nor suggests the features of independent claims 1 and 10, or the respective claimed combinations of features.

Yoshizawa discloses in Figure 4 (referred to in the Office Action) a stencil mask 41 used during fabrication of a semiconductor device, including a membrane layer 42 with apertures in a mask pattern 43, a dual support layer 15 with a mask pattern region 44, and a substrate 47 with a mask region 46. Electron beams are directed through the apertures 43, 44 and 46 and onto a semiconductor surface so as to remove material from the semiconductor surface and form the desired pattern. Applicant maintains the position that the apertures 43, 44 and 46 facilitate the removal of material therethrough, and do not define a deposition area on which source material is deposited, as recited in independent claims 1 and 10.

However, even if the membrane layer 42, dual support layer 45, substrate 47 and associated apertures are improperly compared to the recited first and second substrates and first and second via holes, Yoshizawa still neither discloses nor suggests a bridge as recited in

independent claims 1 and 10. More specifically, Yoshizawa neither discloses nor suggests any type of structure that is positioned on any portion of the membrane layer 42 between adjacent apertures 43, and that extends across the aperture 44, as would the bridge recited in independent claims 1 and 10.

Accordingly, it is respectfully submitted that independent claims 1 and 10 are not anticipated by Yoshizawa, and thus the rejection of independent claims 1 and 10 under 35 U.S.C. §102(b) over Yoshizawa should be withdrawn. Dependent claims 2-6, 11-15 and 22 are allowable at least for the reasons set forth above with respect to independent claims 1 and 10, from which they respectively depend, as well as for their added features.

II. Rejections Under 35 U.S.C. §103(a)

A. Magdo in view of Yoshizawa

The Office Action rejects claims 4 and 10-22 under 35 U.S.C. §103(a) over Magdo in view of Yoshizawa. Claims 16 and 18 are cancelled. The rejection, in so far as it applies to the remaining claims, is respectfully traversed.

As acknowledged in the Office Action and as set forth above, Magdo neither discloses nor suggests the features recited in independent claim 10. Further, as set forth above, Yoshizawa fails to overcome the deficiencies of Magdo. Accordingly, it is respectfully submitted that independent claim 10 is allowable over the applied combination, and thus the rejection of independent claim 10 under 35 U.S.C. §103(a) over Magdo and Yoshizawa should be withdrawn.

Serial No. **10/609,400**

Docket No. **K-0533**

Amdt. dated April 12, 2007

Reply to Office Action of January 5, 2007

Dependent claims 11-15 and 17 are allowable at least for the reasons set forth above with respect to independent claim 10, from which they depend, as well as for their added features.

Likewise, dependent claim 4 is allowable over Magdo at least for the reasons set forth above with respect to independent claim 1, from which it depends, as well as for its added features. Further, as set forth above, Yoshizawa fails to overcome the deficiencies of Magdo. Accordingly, it is respectfully submitted that claim 4 is allowable over the applied combination, and thus the rejection of claim 4 under 35 U.S.C. §103(a) over Magdo and Yoshizawa should be withdrawn.

B. Yoshizawa in view of Magdo

The Office Action rejects claims 7-9 and 16-18 under 35 U.S.C. §103(a) over Yoshizawa in view of Magdo. Claims 7, 9, 16 and 18 are cancelled. The rejection, in so far as it applies to the remaining claims, is respectfully traversed.

Dependent claims 8 and 17 are allowable over Yoshizawa at least for the reasons set forth above with respect to independent claims 1 and 10, from which they respectively depend, as well as for their added features. Further, as set forth above, Magdo fails to overcome the deficiencies of Yoshizawa. Accordingly, it is respectfully submitted that claims 8 and 17 are allowable over the applied combination, and thus the rejection of claims 8 and 17 under 35 U.S.C. §103(a) over Yoshizawa and Magdo should be withdrawn.

Serial No. **10/609,400**
Amdt. dated April 12, 2007
Reply to Office Action of January 5, 2007

Docket No. **K-0533**

C. Yoshizawa

The Office Action rejects claims 19-21 under 35 U.S.C. §103(a) over Yoshizawa. The rejection is respectfully traversed.

Dependent claims 19-21 are allowable over Yoshizawa at least for the reasons set forth above with respect to independent claim 10, from which they depend, as well as for their added features. Further, as set forth above, it would not have been obvious to modify the device disclosed by Yoshizawa in the manner suggested in the Office Action. Accordingly, it is respectfully submitted that claims 19-21 are allowable over Yoshizawa, and thus the rejection of claims 19-21 under 35 U.S.C. §103(a) over Yoshizawa should be withdrawn.

D. Bohlen

The Office Action rejects claims 4, 13 and 19-21 under 35 U.S.C. §103(a) over Bohlen. The rejection is respectfully traversed.

Dependent claims 4, 13 and 19-21 are allowable over Bohlen at least for the reasons set forth above with respect to independent claims 1 and 10, from which they respectively depend, as well as for their added features. Further, it is respectfully submitted that the recited features are not obvious over Bohlen. Accordingly, it is respectfully submitted that claims 4, 13 and 19-21 are allowable over Bohlen, and thus the rejection should be withdrawn.

Serial No. **10/609,400**

Docket No. **K-0533**

Amdt. dated April 12, 2007

Reply to Office Action of January 5, 2007

E. Bohlen in view of Magdo

The Office Action rejects claims 7-9 and 16-18 under 35 U.S.C. §103(a) over Bohlen in view of Magdo. Claims 7, 9, 16 and 18 are cancelled. The rejection, in so far as it applies to the remaining claims, is respectfully traversed.

Dependent claims 8 and 17 are allowable over Bohlen at least for the reasons set forth above with respect to independent claims 1 and 10, from which they respectively depend, as well as for their added features. Further, as set forth above, Magdo fails to overcome the deficiencies of Bohlen. Accordingly, it is respectfully submitted that claims 8 and 17 are allowable over Bohlen and Magdo, either alone or in combination, and thus the rejections should be withdrawn.

III. Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, JOANNA K. MASON, at the telephone number listed below.

Serial No. **10/609,400**

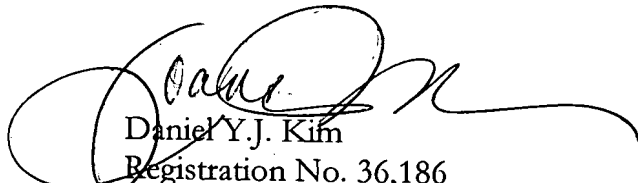
Docket No. **K-0533**

Amdt. dated April 12, 2007

Reply to Office Action of January 5, 2007

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
KED & ASSOCIATES, LLP



Daniel Y.J. Kim
Registration No. 36,186
Joanna K. Mason
Registration No. 56,408

P.O. Box 221200

Chantilly, Virginia 20153-1200

(703) 766-3777 DYK/JKM:jljg

Date: April 12, 2007

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Please direct all correspondence to Customer Number 34610